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#5  
6/26/02

June 26, 2002

To: Mr. Ed L. Swinehart - USPTO Art Unit 3617  
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Application/Control Number: 09/781.167  
Subject: Response to Election/Restriction Office Action

Dear Mr. Swinehart:

Thank you very much the comments and assistance you gave me in our conversation of June 25, 2002. I will make the required election below along with arguments in favor of your consideration of my three main claims in a single application as opposed to eventual consideration in multiple separate applications. Since I will be leaving for 4-5 weeks at the end of June I would appreciate your confirming by fax or email that you have received my reply, and that it conforms to the applicable format for such responses.

1. Election:

As required, I elect claim 2 and its dependent claims, 7-12. However, I believe the unique interfaces and synergies of the invention's main claims and its conceptual advances over the prior art warrant your considering whether the invention's main claims should be reviewed simultaneously. Should you find the following arguments persuasive, I will appreciate any suggestion for modifying any of my claims to facilitate simultaneous review of all the invention's claims.

2. Rationale for simultaneous consideration of three main claims:

- a. Scope of protection - The invention comprises a system that includes both rolling and hoisted elliptical sails as well as a sail storage system for hoisted sails. This unprecedented comprehensive system enables any conventionally rigged sailboat to employ the most efficient sail form for all its sails, regardless of how such sails are deployed. Each of the system elements has independent novelty and utility. Designers have heretofore considered each such element unfeasible and have not even attempted to achieve the synergies afforded by the unique interfaces between the invention's elements.
- b. The advantages of a single elliptical sail are remarkable. The synergy of result achieved by combining a plurality of such sails is extraordinary. The manner in which the sail system design concept of the present invention delivers these properties brings optimum convenience, safety and performance to any sailboat. Sail deployment means is not a particularly useful method of describing such a system. Functionally speaking, the advance over the prior art is the invention's universal compatibility with any sailboat without regard to sail deployment method.

The system is not a conventional narrow function invention as seen in the prior art, and its advance over the prior art should not be diluted by descriptions of existing subclasses. Furling sails became a reality, then a subclass derived. It would have been unfortunate if inventors of furling sail configurations had been denied protection because their inventions were not precisely covered by then-existing subclasses.

- c. A transition from sail design to sail system design -

*[Handwritten signature]*

Such a conceptual transition is as important as the ability to reduce elliptical sail form theories to practice within the lateral and fore and aft geometric confines of any conventionally rigged sailboat. Neither sail system design nor universally compatible elliptical fore and aft sails exist in the prior art, both having been considered unfeasible to the present time. A brief explanation of the functional aspects of the problem appears below.

d. Underlying theoretical basis —

The invention introduces and employs specific maximum positive roach, or "overlap" parameters that enable universal practical application of elliptical sail form to both headsails and mainsails for any conventionally rigged sailboat. Designers have considered such specific parameters unfeasible. Thus, individual elliptical headsails and mainsails for conventionally rigged sailboats did not appear, let alone combinations of such sails.

e. Impossible problems solved by comprehensive system approach — Each system element, and the synergies afforded by various combinations of such elements prove that fully powered elliptical headsails and mainsails are indeed feasible for boats with permanent backstays and diverse means of sail deployment. The present invention's extensive prototype history establishes this feasibility. Heretofore universal application of elliptical sail form to conventionally rigged sailboats was deemed impossible.

f. Comprehensive applicability of the present invention —

The invention's universal compatibility is as unique as each of its elements, and protection should be extended to the universal sailing solutions enabled by the invention while foreclosing potential imitators from copying some of the system elements and omitting others. An election or restriction, as required by the present Office Action would significantly further such imitation.

Protection against imitators would be diluted by either requiring an election of one main claim or by reduction of the three main claims to a single global claim. Reduction of my three claims to a single claim comprising elliptical rolling headsails and mainsails, elliptical hoisted headsails and mainsails, and self-supported stowage for hoisted sails would allow potential imitators to sell one or more of the invention's elements by the simple expedient of eliminating or varying one or more less significant details of the system elements. This is contrary to the invention's basic objective of enabling cockpit-controlled elliptical headsails and mainsails for any sailboat for diverse sail deployment methods.

b. Policy and cost considerations — The invention's system approach is an important conceptual advance over the prior art, one that merits protection. Users should be able to purchase an entire wardrobe of elliptical mainsails and headsails at once or in stages. Logically, the invention's protection should extend to both such marketing eventualities. Finally, consideration of all my main claims simultaneously would not only provide the maximum advance over the prior art, but should be most economic and efficient from both an administrative point of view and that of a small entity applicant.

3. Functional aspects of the invention:

a. The vast majority of sailboats has masts supported by fore and aft and lateral wire shrouds and stays, or "rigging". Heretofore, designers have assumed that elliptical fore and aft sails whose aft ends, or "roach" overlapped such rigging, were not feasible. The present inventor discovered that not only were elliptical

sails universally feasible, but that specific parameters for the amount of overlap were possible. This underlying theoretical basis allows universal application of the most efficient elliptical sail form to any sailboat, much in the way of fitting a more powerful and efficient motor into a space that was assumed incapable of receiving such a motor. This unprecedented universality does not depend on a choice of deployment method. Rather, it enables an efficient and economic choice of deployment method.

- b. Heretofore, the abovementioned design assumptions limited sails permanently attached to a stay or mast, or "in-place" headsails and mainsails to relatively small and inefficient triangular form that did not overlap a boat's rigging. In transcending such assumptions the present invention enabled a comprehensive approach to sail system design.
- c. Performance alternatives – taller masts, exotic materials, in-place sails with longer horizontal, or "foot" dimensions, or free-flying sails comprise principal performance enhancement techniques in the prior art. None of these is cost-effective.
- d. Costly structural modifications are required by changes in mast or materials, and free flying sails require dangerous deck maneuvers and costly equipment. The present invention eliminates each of these disadvantages without modification to boat or rig and at minimal cost. It does so by virtue of the fact that the increased elliptical surface area actually causes a boat to lean or "heel" less than triangular sails of less surface area.

The result of less heel is greater forward speed and greater safety and comfort because the boat is flatter with relation to the water. The reduced turbulence of elliptical sails and the interface between such sails produces a synergy of result that is unique, beyond the effect of each such individual elliptical sail. Hence, the present invention is a cost effective alternative to costly traditional approaches, which do nothing to aid safety or convenience. The combination of such sails delivers synergies of result that merit protection beyond the individual elements.

- e. The invention's storage system for hoisted sails as integral system element – The invention's storage system for hoisted sails makes less expensive and more efficient hoisted sails as convenient and safe to use as furling sails and thus a viable market alternative to them. This significant advance would be lost if the hoisted headsail described in claim 2 were deprived of its companion automatic stowage system. The invention combines elliptical power for hoisted sails with full safety and convenience features, and the two should not be separated.

#### 4. Specific Response to June 11, 2002 Office Action:

- a. Election between claims drawn to horizontally deployed sails, vertically deployed sails, and storage means for vertically deployed sails – While the invention's claims do employ these distinctions to provide protection to individual system elements, it was not intended that the system elements claimed be separated, and it is not clear that the subclasses cited in the Office Action should impose such an election or restriction.
  - 1) Subclass 107 cited in comment "1. I" covers devices for shortening sails "other than fore and aft sails". Since the invention includes only fore and aft sails, subclass 107 would not be useful with respect to any of the invention's main claims.

In fact, one of the invention's primary objectives is to provide high performance sailing without resort to inconvenient and often dangerous spinnakers and similar sails, which are not fore and aft sails, and which impose costly equipment, additional stowage space and above all, dangerous on-deck sail handling by skilled crew members, regardless of whether such sails are hoisted or furled.

Spinnakers and similar free flying sails are not attached to a mast or a stay in contrast to fore and aft sails. As such, the former sails must be hoisted and lowered with each change in tack or significant change in wind or sea conditions. The presence or absence of a sail rolling, or furling device has no effect on mandatory on-deck sail handling required the spinnakers and similar sails described by subclass 114/107.

- 2) Comment "1.II" cites subclass 114/104 as controlling the invention's claims 2 and 7-12. This broadly defined subclass, which is limited to inventions for taking in or shortening sail, can refer to both vertically and horizontally deployed fore and aft sails. The very nature of the subclass suggests that its focus is on the function of reefing and furling devices, not the method of sail deployment that might be involved.

This argument is further supported by the fact that subclass 114/106 for shortening fore and aft sails refers to rollers on booms, masts and stays. Boom rollers deploy sails vertically, whereas mast and stay rollers deploy sails horizontally. The subclass includes both deployment forms. Thus, existing subclasses are drawn along functional lines and do not suggest an election based on the presence of vertical or horizontal deployment means in a claim.

Moreover, the reefing means of the sails in claim 2 are but a part of the sails described in claim 2. Accordingly, subclass 104, which refers only to reefing and furling may not be sufficiently broad to cover claims 2 and 7-12.

- 3) Claims 3 and 13-18 are described in comment "1.III" as being covered by 114/104. Here, too, the cited subclass does not appear to fit the subject of claim 3.
- 4) The subject storage system receives its companion sail as it is either lowered or reefed in a controlled manner thanks to the sail's vertical deployment control system, integral one-line reefing system and integral downhaul. Each of these elements contributes to an unexpected result not found in or suggested by the prior art, that of making a hoisted sail as safe and convenient to use as a furling sail. It should also be noted that the stowage bag of the Doyle patent cited in my application, (US Patent No. 4,741,281, May 3, 1988, is classified under subclass 114/102, which also appears inappropriate to the subject storage system.
- 5) It further appears that existing subclasses are not exhaustive, and that they derive from past inventions. As such, the nature of the present invention need not fall under existing subclasses.

- 6) As concerns the alternate use described in comment "1. III", I would argue that it is not a reasonable use pursuant to MPEP 806.05 (d). Market reality is contrary to the suggested use of the storage system of claim 3 as "a storage device for non-batten type sails without integral means for reefing and booming."

Such non-battened sails are found as mainsails only on very small boats and virtually never on boats over 20 feet long. In no case would the subject storage system be useful for non-battened mainsails.

As concerns headsail storage, the fact that existing "lazy bags" are not used for non-battened headsails and not at all for corroborates the above argument. If a use existed, it would be suggested by market realities. Such is not the case.

In fact, existing storage systems are not used for headsails at all because of their open-ended construction and because known headsails do not have effective integral reefing or deployment control systems which would enable the use of a headsail-appropriate storage system. The subject storage system is useful when combined with controlled deployment and recovery means. Non-battened sails are incompatible with deployment control means, notably vertical lines running through the sail, as in claim 2. The uncontrollable deployment and recovery of non-battened sails makes the suggested alternate use unrealistic and unreasonable.

As noted above, the subject stowage system is particular to battened sails with companion systems for controlled deployment and recovery. Notably it is useful with vertical control lines running through the companion sail. In distinct contrast to existing stowage bags, the subject stowage system does not require for support paired lines on either side of the sail, or "lazy jacks". A principal objective of the subject bag is to eliminate the need for cumbersome lazy jacks that foul battens as sails are hoisted or lowered.

The subject storage system is typically supported by a topping lift, which also supports the companion sail during deployment, reefing and recovery.

Such topping lifts run from the lower aft extremity, or clew of a sail upwards to a point on a mast, and serve both to support the companion sail during deployment, recovery and reefing and also to support the subject storage system. Alternatively, a support fitting could be fitted at the clew of a boomed or a self-boomed sail such as the one of claim 2, but not on a non-battened sail.

A combination of the sail of claim 2 and the storage system of claim 3 brings results that are at once synergistic and unexpected, but which would not maintain in the case of non-battened sails. The latter sails are neither supported vertically at their clews nor held in horizontal extension by battens or booming means and thus flog and collapse when raised, reefed, or lowered. An uncontrolled flogging sail requires that crew go forward, often in dangerous conditions, to control it, and to arrange it in folds or "flakes", or to set reef points.



The combination of battens and the abovementioned integral control and reefing means eliminates this dangerous procedure and is not replicated if a non-battened sail is combined with the subject stowage system.

There is no practical reason to use the subject stowage system with a non-battened sail.

The abovementioned cumbersome and often extremely dangerous procedure is precisely what the integral control lines, reefing system, battens, and self-booming of the sail of claim 2 eliminate. All procedures are cockpit controlled, and the subject storage system rests below the controlled sail ready to receive it at all times. Total cockpit control would be impossible with a non-battened flogging sail.

Accordingly, the subject storage system is not reasonably useful for non-battened sails. Any attempt to use the subject storage system with such sails would render meaningless the storage system's rapid closure and permanent in-place convenience.

The abovementioned synergies of result bring hoisted sails to a safety and convenience parity with furling sails while maintaining the lower cost and superior sail performance inherent to hoisted sails. Separating the system sail and companion storage system would deprive the invention of these surprising synergies, which are not even suggested by the prior art.

The fact that the cited subclasses do not encompass the system characteristics of either the invention's hoisted elliptical sails, its furled elliptical sails, or its storage system is due to the fact that the subclasses derive from past inventions of narrow functionality and design concept. A comprehensive system of elliptical sails, or indeed, any comprehensive system of sails whatever, is absent from the prior art.

The invention logically addresses the fact that specific variables including boat use, budget and crew size and skill mandate differing choices between a variety of deployment means. Heretofore, such choices inevitably imposed important compromises.

Hoisted fore and aft sails offered optimum performance at lower cost, but with less convenience and safety than furling counterparts, which by contrast, offered optimum safety and convenience but only limited performance. Notably, triangular furling sails imposed inferior surface area and efficiency in order to achieve effective furling.

Designers accepted these compromises as unavoidable and worked within their confines. The absence of subcategories appropriate to the present invention's comprehensive system concept argues strongly that the prior art simply has not known comprehensive sail system concepts, and that designers systematically accepted and assumed a rigid incompatibility between fully powered elliptical fore and aft sails and conventional sailboat rigs.

## **5. Conclusion:**

Existing subclasses are not specific to the present invention, which introduces a new approach to wind power design. Nor would an election or restriction based on such subclasses advance the prior art. Rather, recognition that the invention's new approach

significantly advances the prior art appears appropriate. It would seem appropriate and consistent with applicable law to refrain from imposing subclasses that do not describe the invention, and to examine the invention's claims simultaneously under the basic class categorization. The evolution of classes to subclasses and further divisions, for example, 102.32 confirms that subclasses are neither exhaustive nor immutable.

Since the present invention eliminates the respective compromises heretofore inherent in furling and hoisted fore and aft sails, the invention could well support an entirely new subclass, if such were desirable or required. The invention enables an unprecedented choice between hoisted and furling sail configurations based on individual boat and crew requirements without compromising performance, safety or ease of use. Until now, this has been considered unfeasible, hence the absence of an appropriate subclass.

Beginning with the premise that the prior art is best advanced by universal practical application of the efficient and cost-effective elliptical sail form, a natural extension would be based along functional lines rather than whether sail deployment is vertical or horizontal. The issue would be what the system does that is new and useful.


Protection of how the system accomplishes these results might appropriately channel through protecting both the system's elements and its overall results. Imitators should not be allowed to copy important component parts of a system by simply refraining from copying one or more of its less significant parts. Simultaneous examination of all the present invention's claims would prevent such inequity. The claims are so interrelated functionally that separating them would reduce materially the effectiveness of the invention.

Finally, the main claims were drawn to focus on three particular system elements with a view to providing a viable basis for examination and a viable defense against potential imitators. However, each claim, as written can comprise all system elements. It would not serve either the art or equity to require a separation or restriction that deprives any claim of the synergies and surprising results afforded by the interface between the system elements.

The system's unexpected results maintain regardless of whether a hoisted elliptical mainsail combines with a furling elliptical headsail, or a user or designer chooses some other combination of elliptical sail system elements. This extensive, user-specific range of choices constitutes a major advance over the prior art and also enables a new economics for designers and boat builders. Low cost, fully powered, universally compatible elliptical sails can now supplant taller masts, exotic materials and other cost-prohibitive and less effective design solutions. The prior art has not known such an approach or advance.

The system elements function simultaneously in harmony and in various combinations, which lead to the abovementioned synergies of result. For the foregoing reasons the inventor respectfully requests a reconsideration of the requirement to elect or restrict, and that the invention's claims be considered simultaneously.

Sincerely,

  
Lowell S. Fink

Official

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